IN THE SPECIFICATION

1. Please amend the title of the invention as follows:

CATHODE FOR ELECTRON TUBE HAVING NEEDLE-SHAPED CONDUCTIVE MATERIAL AND METHOD OF PREPARING THE CATHODE

2. Please amend paragraph [0046]-[0047] as follows:

[0046] FIG. 6 is a scanning electron microscope (SEM) photograph of the oxide cathode layer shown in FIG. 4, taken with 400 times magnification;

[0047] FIG. 7 is a photograph of a scanning electron microscope (SEM) photograph of the cathode shown in FIG. 4, taken with 3000 times magnification;

3. Please amend paragraph [0059]-[0060] as follows:

[0059] In contrast with the electron-emitting material layer of the conventional oxide cathode, which is made of a barium-based carbonate, for example, a ternary carbonate $(Ba\text{-}Sr\text{-}Ca)CO_3$ or a binary carbonate $(Ba\text{-}Sr)CO_3$, the oxide cathode according to the present invention contains a needle-shaped conductive material in an electron-emitting material layer, as shown in FIGS. 4 and 5. The needle-shaped conductive material is electrically conductive with a specific resistance not higher than 10^{-1} cm (centimeters), and is more advantageous to form a conductive path within the electron-emitting material

layer than the spherical conductive material. Thus, deterioration due to generation of Joule heat can be sufficiently suppressed by adding a much smaller amount of the needle-shaped conductive material and also , since the content of the electron-emitting material is relatively increased, the initial emission characteristic is improved.

[0060] Further, as seen in FIG. 12, surface roughness of the electron-emitting material layer 50, which is measured as the distance "d" between the highest point 50a and the lowest point 50b on the surface of the electron-emitting material layer 50, is controlled to be under 10 μm (microns), a variation in the voltage due to a difference in the distance between the cathode and the first grid[[,]] is minimized, and shrinkage of the cathode due to a long operating time of the cathode can be reduced. Thus, luminance and life span under a high current density can be noticeably improved.

4. Please amend paragraph [0075] as follows:

[0075] The reason for adding a reducing agent such as tungsten or aluminum to the metal layer is to compensate for the lengthened diffusion path of the reducing agent of the base metal. Preferable content of the reducing agent is 1 to 10% by weight for tungsten, and 0.01 to 1% by weight for aluminum, based on the total weight of nickel powder. When the contents of reducing agents are within these ranges, electron emission is superior and stable. The same effect can also be obtained by using a reducing metal such as tantalum, chromium, magnesium or silicon, instead of tungsten or aluminum. The reducing metal can also be any combination of metals such as tantalum, chromium,

magnesium, or silicon.

5. Please amend paragraph [0107] as follows:

[0107] A lifetime characteristic of each prepared cathode was ~~carried out~~ evaluated by measuring a change in the cathode current (Ik) over operating time under cathode load conditions of the heater operating voltage of 6.3 V (volts), the operating temperature of 760 °C (degrees Celsius) and the initial current density of 5A/cm ^{2} (amperes per centimeters squared), which was determined as the Ik (cathode current) residual rate for a predetermined period of time. Generally, the lifespan of a cathode is defined as values of a mean time to failure mode (MTTF), which corresponds to the lapse of time until the Ik (cathode current) residual rate reaches 50%. FIG. 8 shows evaluation results of the lifetime characteristics of the cathodes prepared in the Examples of the present invention and the Comparative Examples for a high current density of 5A/cm ^{2} (amperes per centimeters squared) , and FIG. 9 shows an MTTF (mean time to failure mode) estimated from the evaluation results for the lifetime characteristics of the cathodes prepared in the Examples of the present invention and the Comparative Examples. While the conventional cathode (Comparative Example 1) demonstrated 4,000 to 5,000 hours, the cathodes of the present invention demonstrated greater than or equal to 25,000 hours. That is, the lifetime characteristics remarkably improved compared to the conventional cathode. Also, the cathodes according to the present invention showed substantially no reduction in barium evaporation and cut off drift amount. FIG. 10 illustrates a variation

in the cut-off voltage (cut-off drift) of cathodes operated for 5000 hours relative to the initial cut-off voltage, from which it was confirmed that the cathodes prepared in the Examples of the present invention showed noticeably reduced emission characteristics over operating time and excellent lifetime characteristics for a high current density of 5 A/cm^2 (Amperes per centimeters ~~squred~~ square), compared to the cathodes prepared in Comparative Examples.

6. Please amend paragraph [0113] as follows:

[0113] Pore size distribution was determined as a ratio of a predetermined area to an area occupied by pores of a cathode photographed by an SEM (scanning electron microscope) taken with approximately 3000 times magnification. It was confirmed from the measurement results that the pore sizes of the cathodes of Examples 1 and 2 [[was]] were less than or equal to 5 μm (microns), whereas the cathodes prepared in Comparative Examples 1 and 2 had the pore size of approximately 20 μm (microns).